



# Coronavirus Disease 2019 (COVID-19)

MENU >

## Forecasts of Total Deaths

Updated July 23, 2020

[Print](#)

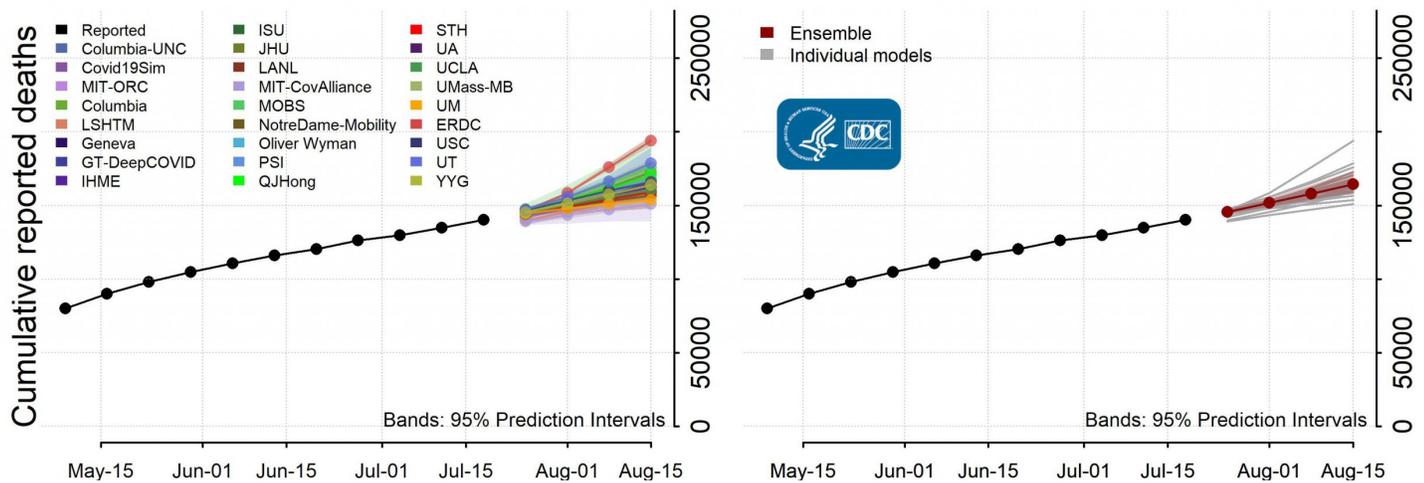
Observed and forecasted cumulative reported COVID-19 deaths as of July 20, 2020.

## Interpretation of Cumulative Death Forecasts

- This week CDC received 26 individual national forecasts.
- This week’s national ensemble forecast predicts there will likely be between 160,000 and 175,000 total reported COVID-19 deaths by August 15th.
- National and state-level ensemble forecasts suggest that the number of new deaths over the next 4 weeks will likely exceed the number reported over the last 4 weeks for the US overall, as well as in 25 states and 1 territory. The jurisdictions with the greatest likelihood of a larger number of deaths include Alabama, Florida, Georgia, Idaho, Nevada, Oklahoma, South Carolina, Texas, and Utah.

## National Forecast

### National Forecast



- The figure shows cumulative reported COVID-19 deaths and forecasted deaths for the next four weeks in the United States.
- Models make various assumptions about the levels of social distancing and other interventions, which may not reflect recent changes in behavior. See model descriptions below for details.

# State Forecasts

State-level forecasts figures show observed and forecasted state-level cumulative COVID-19 deaths in the US. Each state forecast uses a different scale, due to differences in the numbers of COVID-19 deaths occurring in each state.

Forecasts fall into one of two categories:

- The Columbia-UNC, COVID19Sim, ERDC, Geneva, GT-DeepCOVID, ISU, LANL, LSHTM, MIT-CovAlliance, MIT-ORC, MOBS, Oliver Wyman, NotreDame-Mobility, QJHong, STH, UA, UM, UMass-MB, USC, and UT forecasts assume that existing control measures will remain in place during the prediction period.
- The Columbia, GT-CHHS, IHME, JHU, NotreDame-FRED, PSI, UCLA, and YYG forecasts make different assumptions about how levels of social distancing will change in the future.

[Download state forecasts](#)  [12 pages]

[Download forecast data](#)  [1 sheet]

## Modeling Groups

Forecasts were provided by these modeling groups:

### [Columbia University](#)

**Model name:** Columbia

**Intervention assumptions:** This model assumes that contact rates will increase 5% per week over the next two weeks. The reproductive number is then set to 1 for the remainder of the projection period.

**Methods:** Metapopulation SEIR model.

### [Columbia University and University of North Carolina](#)

**Model name:** Columbia-UNC

**Intervention assumptions:** This model assumes that transmission intensity will peak in early July and then gradually decline.

**Methods:** Statistical survival-convolutional model.

### [COVID-19 Simulator Consortium](#)

**Model name:** Covid19Sim

**Intervention assumptions:** This model is based on assumptions about how levels of social distancing will change in the future.

**Methods:** SEIR model.

## [Georgia Institute of Technology, Center for Health and Humanitarian Systems](#)

**Model name:** GT\_CHHS

**Intervention assumptions:** This model assumes that once stay-at-home orders are lifted, contact rates will gradually increase. It also assumes that some households containing symptomatic cases will self-quarantine.

**Methods:** Agent-based model.

## [Georgia Institute of Technology, College of Computing](#)

**Model name:** GT-DeepCOVID (formerly GA\_Tech)

**Intervention Assumptions:** This model assumes that the effects of interventions are reflected in the observed data and will continue going forward.

**Methods:** Deep learning.

## [Institute of Health Metrics and Evaluation](#)

**Model name:** IHME

**Intervention assumptions:** Projections are adjusted to reflect differences in aggregate population mobility and community mitigation policies.

**Methods:** Combination of a mechanistic disease transmission model and a curve-fitting approach.

## [Iowa State University](#)

**Model name:** ISU

**Intervention Assumptions:** These projections do not make specific assumptions about which interventions have been implemented or will remain in place.

**Methods:** Nonparametric spatiotemporal model.

## [Johns Hopkins University, Infectious Disease Dynamics Lab](#)

**Model name:** JHU

**Intervention Assumptions:** This model assumes that the effectiveness of interventions is reduced after shelter-in-place orders are lifted.

**Methods:** Stochastic metapopulation SEIR model.

## [London School of Hygiene and Tropical Medicine](#)

**Model name:** LSHTM

**Intervention assumptions:** These projections assume that current interventions will not change during the forecasted period.

**Methods:** This forecast is an ensemble of three different models: A time-varying reproductive number-based model, a time series model based on numbers of deaths, and a time series model based on numbers of cases and deaths.

## [Los Alamos National Laboratory](#)

**Model name:** LANL

**Intervention assumptions:** This model assumes that currently implemented interventions and corresponding reductions in transmission will continue, resulting in an overall decrease in the growth rate of COVID-19 deaths.

**Methods:** Statistical dynamical growth model accounting for population susceptibility.

## [Massachusetts Institute of Technology, COVID-19 Policy Alliance](#)

**Model name:** MIT-CovAlliance

**Intervention Assumptions:** The projections assume that current interventions will remain in place indefinitely.

**Methods:** SIR model.

## [Massachusetts Institute of Technology, Operations Research Center](#)

**Model name:** MIT-ORC

**Intervention Assumptions:** The projections assume that if cases reach a certain threshold, interventions will be reinstated.

**Methods:** SEIR model.

## [Northeastern University, Laboratory for the Modeling of Biological and Socio-technical Systems](#)

**Model name:** MOBS

**Intervention assumptions:** The projections assume that social distancing policies in place at the date of calibration are extended for the future weeks.

**Methods:** Metapopulation, age-structured SLIR model.

## [Notre Dame University](#)

### **Model names:**

- NotreDame-Mobility
- NotreDame-FRED (state-level forecasts only)

**Intervention assumptions:** These forecasts assume that population-level mobility is a reliable proxy for adherence to social distancing, and that recent trends in mobility will continue over the coming weeks.

### **Methods:**

- NotreDame-Mobility: SEIR model fit to data on deaths, test positivity, and population mobility.
- NotreDame-FRED: Agent-based model.

## [Oliver Wyman](#)

**Model name:** Oliver Wyman

**Intervention assumptions:** These projections assume that current interventions, will remain unchanged during the forecasted period.

**Methods:** Time-dependent SIR model for detected and undetected cases.

## [Predictive Science Inc.](#)

**Model name:** PSI

**Intervention assumptions:** These projections assume that current interventions will not change during the forecasted period.

**Methods:** Stochastic SEIRX model.

## [Qi-Jun Hong](#)

**Model name:** QJHong

**Intervention assumptions:** These projections assume that current interventions will not change during the forecasted period.

**Methods:** Machine learning using case data and mobility data.

## [Robert Walraven](#)

Note: This group did not submit a forecast this week.

**Model name:** ESG

**Intervention assumptions:** These projections assume that current interventions will not change during the forecasted period.

**Methods:** Fitting reported data to multiple skewed gaussian distributions.

## [Steve Horstman](#)

**Model name:** STH

**Intervention assumptions:** These projections assume that current interventions will not change during the forecasted period.

**Methods:** Statistical growth model.

## [US Army Engineer Research and Development Center](#)

**Model name:** ERDC

**Intervention assumptions:** These projections assume that current interventions will not change during the forecasted period.

**Methods:** SEIR model.

## [University of Arizona](#)

**Model name:** UA

**Intervention assumptions:** This model assumes that current interventions will remain in effect for at least four weeks after the forecasts are made.

**Methods:** SIR mechanistic model with data assimilation.

## [University of California, Los Angeles](#)

**Model name:** UCLA

**Intervention assumptions:** This model assumes that contact rates will increase as states reopen. The increase in contact rates is calculated for each state.

**Methods:** Modified SEIR model.

## University of Geneva/Swiss Data Science Center (one-week ahead forecasts only) [↗](#)

**Model name:** Geneva

**Intervention assumptions:** The projections assume that social distancing policies in place at the date of calibration are extended for the future weeks.

**Methods:** Exponential and linear statistical models fit to the recent growth rate of cumulative deaths.

## University of Massachusetts, Amherst [↗](#)

**Model names:** UMass-MB, Ensemble

**Intervention assumptions:**

- UMass-MB: These projections do not make specific assumptions about which interventions have been implemented or will remain in place.
- Ensemble: The national and state-level ensemble forecasts include models that assume certain social distancing measures will continue and models that assume those measures will not continue.

**Methods:**

- UMass-MB: Bayesian SEIRD model.
- Ensemble: Equal-weighted combination of 2 to 11 models, depending on the availability of national and state-level forecasts. To ensure consistency, the ensemble includes only models with 4 week-ahead forecasts and models that do not assign a significant probability to there being fewer cumulative deaths than have already been reported by the day of submission. Only one model was available for the forecasts for Guam and the Northern Mariana Islands.

## University of Michigan [↗](#)

**Model name:** UM

**Intervention assumptions:** These projections assume that current interventions will remain unchanged during the forecasted period.

**Methods:** Ridge regression

## University of Southern California [↗](#)

**Model name:** USC

**Intervention assumptions:** These projections assume that current interventions will remain unchanged during the forecasted period.

**Methods:** SIR Model.

## [University of Texas, Austin](#)

**Model name:** UT

**Intervention assumptions:** This model estimates the extent of social distancing using geolocation data from mobile phones and assumes that the extent of social distancing will not change during the period of forecasting. The model is designed to predict confirmed COVID-19 deaths resulting from only a single wave of transmission.

**Methods:** Nonlinear Bayesian hierarchical regression with a negative-binomial model for daily variation in death rates.

## [Youyang Gu \(COVID-Projections\)](#)

**Model name:** YYG

**Intervention assumptions:** The model accounts for individual state-by-state re-openings and their impact on infections and deaths.

**Methods:** SEIS mechanistic model.

### Additional Resources:

[Previous COVID-19 Forecasts](#)

---

[FAQ: COVID-19 Data and Surveillance](#)

---

[CDC COVID Data Tracker](#)

---

[COVID-19 Mathematical Modeling](#)

Last Updated July 23, 2020

Content source: [National Center for Immunization and Respiratory Diseases \(NCIRD\), Division of Viral Diseases](#)